

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 4564 (1968): Fireclay nozzles [MTD 15: Refractories]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard
**SPECIFICATION FOR
FIRECLAY NOZZLES**

(First Reprint FEBRUARY 1989)

UDC 666.76:621.746.32

© Copyright 1968

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

SPECIFICATION FOR FIRECLAY NOZZLES

Refractories Sectional Committee, SMDC 18

Chairman

SHRI J. C. BANERJEE

Representing

Central Glass & Ceramic Research Institute
(CSIR), Calcutta

Members

- DR D. N. NANDI (*Alternate to*
Shri J. C. Banerjee)
- SHRI R. V. BAINDOOR The Associated Cement Companies Ltd, Bombay
- SHRI H. N. BANERJEE (*Alternate*)
- SHRI H. V. BHASKAR RAO Bird & Co Private Ltd, Calcutta
- DR K. PRABHU (*Alternate*)
- DR S. BHATTACHARYA Directorate General, Ordnance Factories (Ministry
of Defence), Calcutta
- SHRI D. K. CHAKRAVARTY (*Alternate*)
- SHRI D. S. CHABHAL Directorate General of Technical Development,
New Delhi
- SHRI M. CHANDRASEKHAR Hindustan Steel Ltd (Bhilai Steel Plant), Bhilai
- SHRI S. K. MUKHERJEE (*Alternate*)
- SHRI D. K. CHATTERJEE M. N. Dastur & Co (Private) Ltd, Calcutta
- CHEMIST & METALLURGIST (SF) Ministry of Railways
- CHITTARANJAN LOCOMOTIVE
WORKS, CHITTARANJAN
- ASSISTANT DIRECTOR (M & S)
RESEARCH DESIGNS &
STANDARDS ORGANIZATION,
LUCKNOW (*Alternate*)
- SHRI M. H. DALMIA Orissa Cement Ltd, Rajgangpur
- DR J. D. PANDA (*Alternate*)
- SHRI G. C. DAS National Test House, Calcutta
- SHRI N. C. SENGUPTA (*Alternate*)
- DEPUTY DIRECTOR OF MARINE Naval Headquarters
- ENGINEERING (DESIGN), NEW
DELHI
- ASSISTANT DIRECTOR (ENGINE-
ERING), NEW DELHI (*Alternate*)
- SHRI ACHYUT A. GANPULE The Parshuram Pottery Works Co Ltd, Morvi
- SHRI V. H. AGASHE (*Alternate*)
- DR S. S. GHOSE Belpahar Refractories Ltd, Belpahar
- DR A. K. BOSE (*Alternate*)
- SHRI K. K. GUPTA ROY Indian Iron & Steel Co Ltd, Burnpur
- SHRI B. N. CHATTERJEE (*Alternate*)

(Continued on page 2)

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
SHRI K. P. JHUNJHUNWALA	All India Glass Manufacturers' Federation, New Delhi
SHRI R. C. SINGHAL (Alternate)	Bhupal Mining Works, Bhilwara
SHRI K. L. MATHUR	
SHRI D. P. MATHUR (Alternate)	
DR H. K. MITRA	In personal capacity (P16/1B, Keyatala Lane, Calcutta 29)
DR G. N. MOHANTY	Hindustan Steel Ltd (Central Engineering & Design Bureau), Ranchi
SHRI B. RAMACHANDRAN (Alternate)	
SHRI S. L. MOITRA	Orissa Industries Ltd, Rourkela
SHRI B. K. MUKHERJEE	Reliance Firebricks & Pottery Co Ltd, Calcutta
SHRI K. N. MUKHERJEE	The Behar Firebricks & Potteries Ltd, Dhanbad
SHRI S. N. BANERJEE (Alternate)	
SHRI H. P. S. MURTHY	National Metallurgical Laboratory (CSIR), Jamshedpur
SHRI P. S. NARAYANA	The Engineering & Mineral Industrial Research Laboratory, Bangalore
SHRI P. K. PAUL	Hindustan Steel Ltd (Durgapur Steel Plant), Durgapur
SHRI J. R. K. MURTHY (Alternate)	
DR B. RAO	The Tata Iron & Steel Co Ltd, Jamshedpur
SHRI D. K. RAY	Inspection Wing, Directorate General of Supplies & Disposals (Ministry of Works Housing & Supply)
SHRI B. B. BANERJEE (Alternate)	
SHRI A. C. SEN	Hind Refractories Ltd, Calcutta
SHRI G. SAHA (Alternate)	
SHRI D. R. SUBRAMANIAN	Burn & Co Ltd, Calcutta
SHRI K. N. MARWAHA (Alternate)	
SHRI P. S. SUNDARAM	Hindustan Steel Ltd (Rourkela Steel Plant), Rourkela
SHRI M. PRASAD (Alternate)	
DR A. K. CHATTERJEE, Director (Struc & Met)	Director General, ISI (Ex-officio Member)

Secretary

SHRI R. K. SRIVASTAVA
Deputy Director (Met), ISI

Refractories Investigations Subcommittee, SMDC 18 : 3

Convener

SHRI J. C. BANERJEE Central Glass & Cermaic Research Institute (CSIR), Calcutta

Members

SHRI D. N. NANDI (Alternate to
Shri J. C. Banerjee)
SHRI I. B. BANERJEE Hindustan Steel Ltd (Alloy Steels Projects),
Durgapur

(Continued on page 5)

Indian Standard

SPECIFICATION FOR FIRECLAY NOZZLES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 April 1968, after the draft finalized by the Refractories Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 The perfect nozzle is defined to permit teeming of entire cast of metal at a constant rate without splashing on the sides of ingot mould and without contaminating the metal. The nozzle should also maintain a perfect seating for the stopper head so that no dribbling occurs while the ladle is being removed from one mould to the other.

0.2.1 In view of the fact that bloating type of fireclay is not available in the country, only refractory nozzles have been covered in this specification.

0.3 This standard keeps in view the manufacturing and trade practices followed in the country in this field.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for fireclay nozzles for use in ladles of capacity up to 100 tonnes.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of fireclay nozzles shall be as laid down in IS : 1387-1967†.

*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

2.2 The refractories shall be compact, of homogeneous texture and free from cracks, voids and other flaws. They shall be burnt evenly throughout, shall have no soft corners and shall have sufficient mechanical strength. The contour of the place where the stopper head will sit, shall be checked by a template to find out whether the proper contour according to the drawing has been maintained.

3. SAMPLING

3.1 Representative samples shall be drawn according to the scheme of sampling given in IS : 1528-1962* for carrying out tests specified in this standard.

4. TOLERANCE ON SIZE

4.1 Variation from specified dimensions covering both warpage and shrinkage shall be allowed to the extent of ± 1 percent or ± 1 mm whichever is greater.

5. PYROMETRIC CONE EQUIVALENT (SOFTENING POINT)

5.1 When determined in accordance with the method given in IS : 1528-1962*, the refractories shall have a pyrometric cone equivalent (PCE) of not less than Standard Pyrometric Cone (ASTM) No. 28.

6. APPARENT POROSITY

6.1 When tested in accordance with the methods given in IS : 1528-1962*, the apparent porosity of the refractories shall be not more than 25 percent by volume.

7. PERMANENT LINEAR CHANGE AFTER REHEATING

7.1 When the refractories are uniformly heated to 1400°C according to the schedule specified in IS : 1528-1962*, maintained at that temperature, within a variation of $\pm 20^\circ\text{C}$ for 5 hours and slowly cooled, they shall show a variation of not more than 0.5 percent of the original length.

8. MARKING

8.1 Each refractory brick or shape shall be clearly marked with the manufacturer's name or trade-mark.

*Methods of sampling and physical tests for refractory materials.

8.1.1 The brick or shape may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SRI D. GOPALAKRISHNAN	Indian Refractory Makers Association, Calcutta
DR J. D. PANDA (Alternate)	
SRI K. K. GUPTA ROY	Indian Iron & Steel Co Ltd, Burnpur
SRI D. N. BANERJEE (Alternate)	
SRI H. P. S. MURTHY	National Metallurgical Laboratory (CSIR), Jamshedpur
DR B. RAO	The Tata Iron & Steel Co Ltd, Jamshedpur
SRI D. R. SUBRAMANIAN	Burn & Co Ltd, Calcutta
SRI K. N. MARWAHA (Alternate)	

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 3 31 01 31, 3 31 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Telephone

*Western ; Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093 6 32 92 95

†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 36 24 99

Northern : SCO 445-446, Sector 35-C CHANDIGARH 160036 { 2 18 43
3 16 41

Southern : C. I. T. Campus, MADRAS 600113 { 41 24 42
41 25 19
41 29 16

Branch Offices :

Pushpak, Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001 { 2 63 48
2 63 49

'F' Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002 22 48 05

Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003 6 27 16

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002 5 36 27

53/5 Ward No. 29, R. G. Barua Road, 5th Byelane, GUWAHATI 781003 —

5-8-56C L. N. Gupta Marg, (Nampally Station Road), HYDERABAD 500001 22 10 83

R14 Yudhister Marg, C Scheme, JAIPUR 302005 { 6 34 71
6 98 32

117/418B Sarvodaya Nagar, KANPUR 208005 { 21 68 76
21 82 92

Patliputra Industrial Estate, PATNA 800013 6 23 05

Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001 52 27

Inspection Office (With Sale Point):

Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 410005 5 24 35

*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 89 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 27 68 00